

# SYSTEMATIC STUDIES ON THE ANT GENERA OF *CAREBARA*, *RHOPALOMASTIX* AND *KARTIDRIS* IN CHINA (HYMENOPTERA: FORMICIDAE: MYRMICINAE)

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## Abstract

A new record species *C. lignata* Westwood of *Carebara* Westwood is reported in China, its measurements and illustrations are provided. *Rhopalomastix* Forel is a new record genus in China. A new species, *R. umbracapita* sp. n. is described, a key to the known 4 species and 2 subspecies of *Rhopalomastix* of the world is given. A new species *K. sparsipila* sp. n. of *Kartidris* Bolton is discovered, a key to the 6 known species of *Kartidris* of the world is prepared with illustrations. Biological notes are also given to *Carebara lignata*, *R. umbracapita*, and *K. sparsipila*. All the 3 species are collected in the tropical rain forest of Xishuangbanna Nature Reserve.

**Key words:** Formicidae; *Carebara*; *Rhopalomastix*; *Kartidris*; Systematics

During the course studying biodiversity of ants in Xishuangbanna Nature Reserve of Yunnan Province, 1 new record species *Carebara lignata* Westwood and 2 new species *Rhopalomastix umbracapita* sp. n. and *Kartidris sparsipila* sp. n. are discovered and described.

Standard measurements and indices are as defined in Bolton (1983). All measurements are expressed in mm. The type specimens are deposited in the Insect Collection, Department of Forest Protection, Southwest Forestry College, Kunming, Yunnan, China.

## CAREBARA WESTWOOD

*Carebara* Westwood, 1840, *Ann. Mag. Nat. Hist.* 6: 86. Type-species: *C. lignata* Westwood.

Systematic position: Myrmicinae, Pheidologetonini.

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Geographical distribution: Old and new world tropics.

18 species of the genus are known in the world (Bolton, 1995): 5 from Neotropical, 11 from Afrotropical, 1 from Oriental, and 1 from Indo-Australian. Westwood (1840) described *C. lignata* based on female caste, and considered it as the type of *Carebara*. Later, Emery (1889), Forel (1903) and Bingham (1903) reported its worker and male castes. Smith described *C. castanea* from Hong Kong in 1858, however, only the female caste is known to date. Santschi described 1 variety *C. castanea* var. *augustata* from Laos based on female and male castes in 1920, but the worker is unknown.

According to Ettershank (1966), members of this genus are always in association with termites.

### **CAREBARA LIGNATA WESTWOOD, NEW RECORD IN CHINA (Figs. 1, 1-3)**

*Carebara lignata* Westwood, 1840, *Ann. Mag. Nat. Hist.* 6: 86, female.

Workers: TL 1.9—2.0, HL 0.50—0.53, HW 0.48—0.50, CI 95—98, SL 0.30—0.33, SI 60—68, PW 0.30—0.33, AL 0.58—0.60, ED 0.00 ( $n=6$ ). For a full description see Emery (1889), Forel (1903), and Bingham (1903). But a supplement to the morphological description is necessary: Occipital margin nearly straight, occipital corners rounded, lateral margins evenly convex. Mandibles with 4 teeth, the basal 2 very small. Apex of scape reached to  $3/4$  of the distance from antennal fossa to occipital corner. In profile view, petiolar node higher than postpetiolar node; in dorsal view, both petiolar node and postpetiolar node are transverse, the latter slightly broader than the former (about 8:7). Dorsa of head and body with dense decumbent pubescences, head and alitrunk with sparse erect hairs; petiole, postpetiole, and gaster with rich erect hairs.

Distribution: India; Burma; Indonesia (Java).

Materials examined: 30 workers, Sanchahe, 920 m, Mengyang Town, Jinghong County, Yunnan Province, 1997-II-27, No. A97-271 (Lai Yuchu).

Biological notes: A colony including about 804 workers was found under decayed bamboo with a colony of termite symbiosis on the ground. However, the female and male were not found, and the termite was omitted to collect in the field, so that the species name of termite is undetermined.

### **RHOPALOMASTIX FOREL, NEW RECORD IN CHINA**

*Rhopalomastix* Forel, 1900, *Ann. Soc. Ent. Belg.* 44: 24. Type-species, *R. rothneyi* Forel.

Systematic position: Myrmicinae, Melissotarsini.

Geographical distribution: Oriental; Indo-Australian.

According to Bolton (1995), 3 species and 2 subspecies of the genus had been recorded in the world, for detailed information see the following key.

Species of *Rhopalomastix* nest under bark of trees (Wheeler, 1929; Donisthorpe, 1936).

#### **Key to known species and subspecies of *Rhopalomastix* of the world**

1. Females ..... 2
- Workers ..... 5
2. Head and alitrunk smooth and shining, without longitudinal striation. Antenna 11 segmented (Sri Lanka) ..... *R. escherichi* Forel
- Head and / or alitrunk longitudinally striate ..... 3
3. Head without longitudinal striation, alitrunk longitudinally striate. Frontal furrow absent. Antenna

- 11 segmented (Thailand) ..... *R. janeti* Donisthorpe  
 Head and alitrunk longitudinally striate. Head with a frontal furrow reaching to the median ocellus  
 ..... 4
4. Antenna 11 segmented (India) ..... *R. rothneyi* Forel  
 Antenna 10 segmented (Indonesia, Java) ..... *R. rothneyi javana* Wheeler
5. Anterior margin of clypeus straight in the center. Head dark reddish brown (China; Yunnan) (Figs. 1, 4—6) ..... *R. umbracapita* sp. n.  
 Anterior margin of clypeus with a distinct projection in the center (Fig. 8). Head reddish yellow or yellowish-brown ..... 6
6. Second and following segments of gaster with extremely fine transverse striae. Head and alitrunk reddish yellow, gaster brownish ..... *R. janeti* Donisthorpe  
 Second and following segments of gaster without fine transverse striae ..... 7
7. Head longer than broad, about 1.17 times as long as broad. Compound eye with 20 facets (Fig. 1, 7) ..... *R. rothneyi* Forel  
 Head as long as broad. Compound eye with 12—18 facets ..... 8
8. Body total length 1.3—1.8 mm (Figs. 1, 8—10) ..... *R. rothneyi javana* Wheeler  
 Body total length 2.0—2.6 mm (Singapore) ..... *R. rothneyi johorensis* Wheeler

#### ***RHOPALOMASTIX UMBRACAPITA* SP. N. (Figs. 1, 4—6)**

Holotype worker; TL 2.2, HL 0.53, HW 0.50, CI 95, SL 0.23, SI 45, PW 0.35, AL 0.65, ED 0.09. Head nearly square, narrowed anteriorly, lateral sides slightly convex. Occipital margin slightly concave in the center, occipital corners rounded. Mandibles with 4 teeth, the basal 2 small and blunt. Clypeus without longitudinal central carina, anterior margin straight in the center, without a central seta, but with a pair of subcentral setae. Eye with 15 facets, placed at anterior 1/4 of the lateral sides of head. Frontal furrow short, feebly longer than frontal carinae. Antennae 10 segmented, apex of scape reached to 5/9 of the distance from antennal fossa to occipital corner; segments 3—8 very short, apical 2 segments forming the antennal club. Dorsum of alitrunk relatively flat, submarginated laterally, without sutures. In profile view, outline of alitrunk complete, slightly convex. Promesonotal suture and metanotal groove only visible on lateral sides below spiracles. Declivity of propodeum steep. Petiolar node subtriangular in profile view, inclined posteriorly, anterior face sloping, posterior face nearly vertical, dorsal face roundly convex; subpetiolar process small, bluntly angled, subtransparent. Postpetiolar node rounded dorsally, ventral process indistinct. In dorsal view, both petiolar node and postpetiolar node are transverse. Gaster elongate ovate. Mandibles smooth and shining. Dorsal of head and alitrunk with dense fine longitudinal striae, dorsum of head with sparse small punctures in addition; striae of lateral sides of head and occipital margin weakened; lateral sides of alitrunk weakly finely reticulate. Petiolar node, postpetiolar node, and gaster relatively smooth, shining. Dorsal of head and body with sparse suberect hairs and abundant decumbent pubescences, pubescences on gaster dense. Antennal scapes with abundant decumbent pubescences and several suberect long hairs. Tibiae with only rich depressed pubescences. Head dark reddish brown; dorsum of alitrunk and gaster reddish brown; antennae, lateral sides of alitrunk, legs, petiole, and postpetiole brownish yellow.

Holotype; worker, Sanchahe, 960 m, Mengyang Town, Jinghong County, Yunnan Province, 1997-II-27, No. A97-58 (Xu Zhenghui).

This new species is close to *R. rothneyi* Forel (Figs. 1, 7, 8—10) and *R. janeti* Donisthorpe, but an-

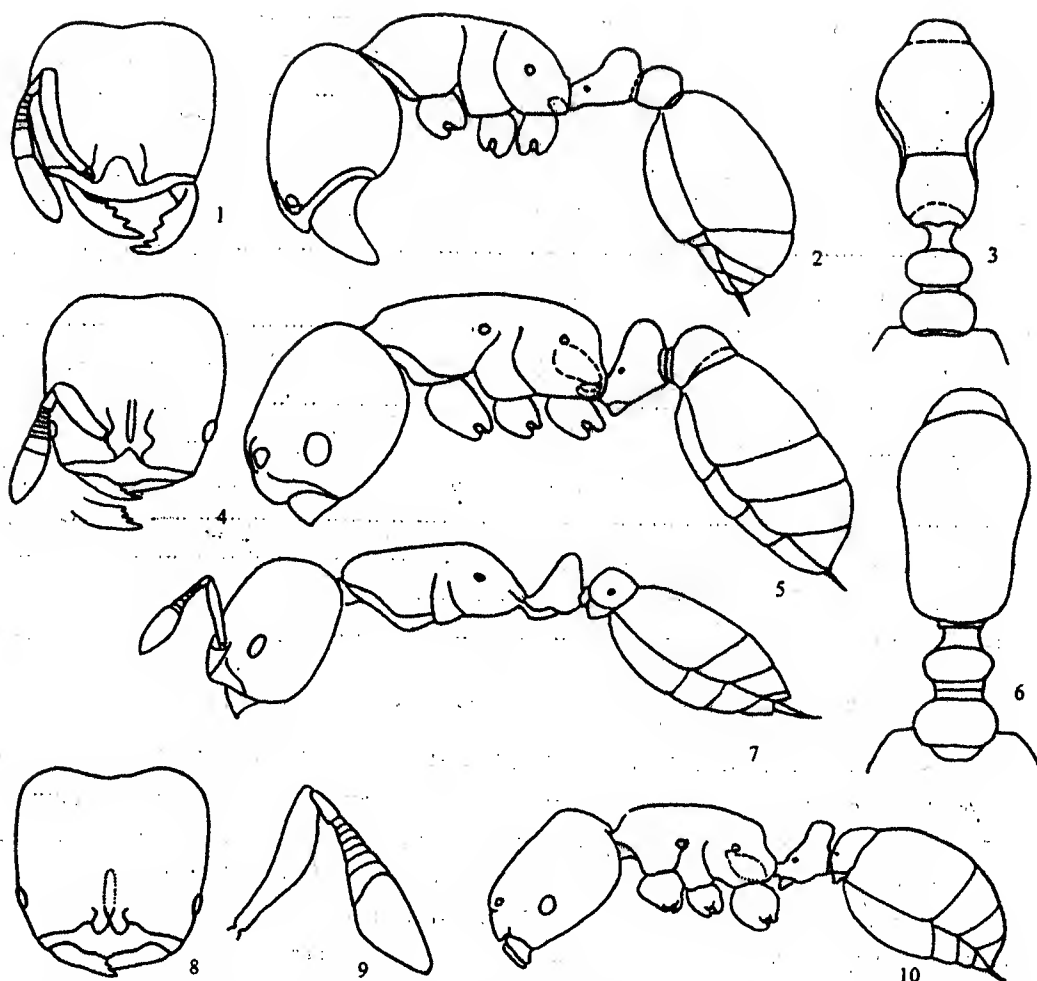


Fig. 1 Workers of *Carebara* and *Rhopalomastix*

1~3 *Carebara lignata* Westwood; 4~6 *Rhopalomastix umbracapita* sp. n.; 7 *R. rothneyi* Forel; 8~10 *R. rothneyi javana* Wheeler. 1, 4, 8, Head in full face view; 2, 5, 7, 10, Body in profile view; 3, 6, Alitrunk, petiole, and postpetiole in dorsal view; 9, Antenna in front view. (7 After Holldobler et al., 1990; 8~10 After Wheeler, 1929)

terior margin of clypeus straight in the middle, without a distinct projection in center; subpetiolar process short, apex blunt, without distinct postsubpetiolar process; second and following segments of gaster without extremely fine transverse striae; head dark reddish brown.

**Biological notes:** The holotype worker was collected from a sample of crown of a tree. The ant may nest and dwell on the tree.

### KARTIDRIS BOLTON

*Kartidris* Bolton, 1991, *Syst. Ent.* 16:10. Type-species, *K. nyos* Bolton.

Systematic position: Myrmicinae: Pheidolini.

Geographical distribution: Oriental.

Bolton (1991) erected the genus and described 3 new species, *K. nyos* from India, *K. galos* from China, and *K. matertera* from Thailand. Lately, Wang (1993) reported a new species, *K. fujianensis*, from

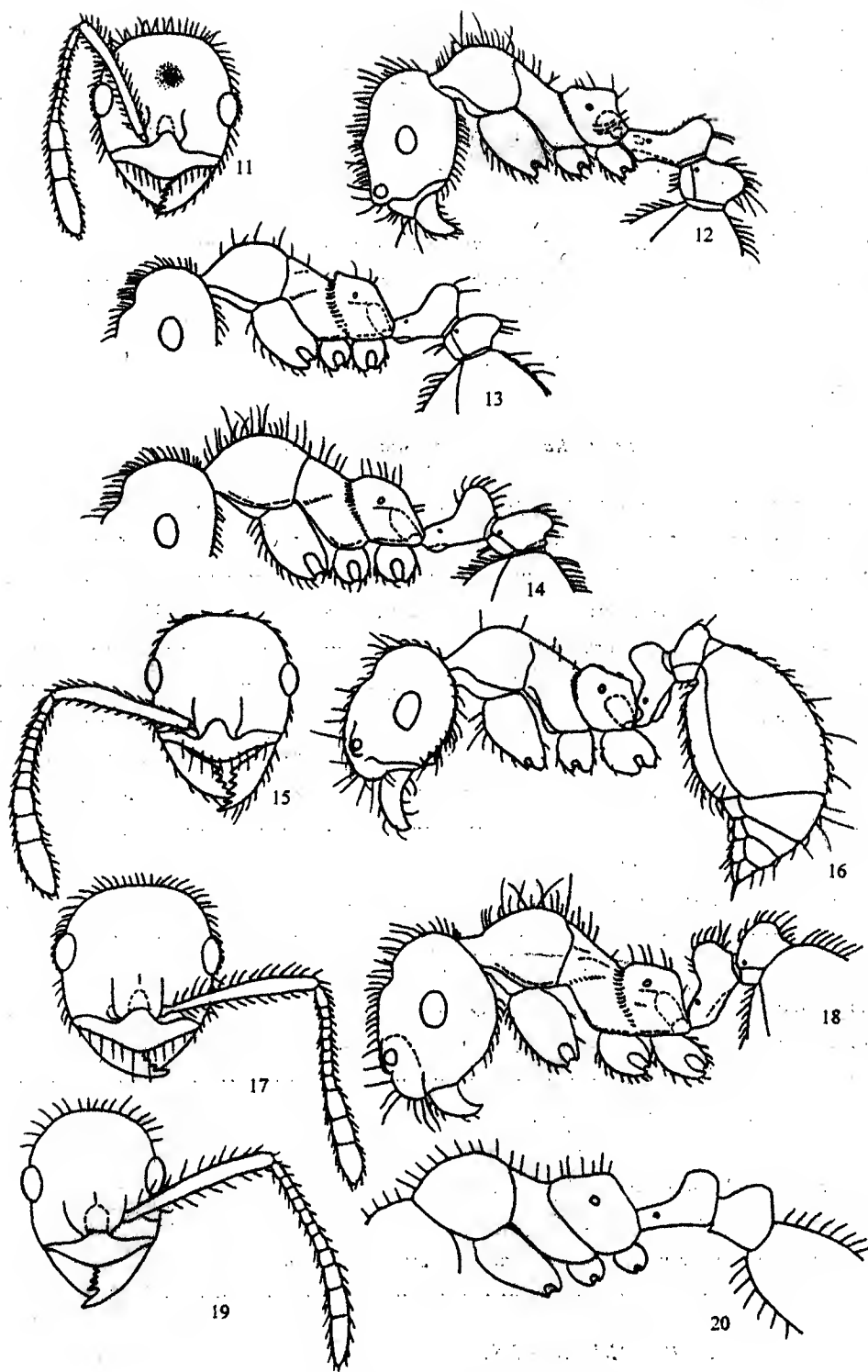


Fig. 2 *Kartidris* workers

11~12 *K. ashima* Xu et Zheng; 13 *K. matertera* Bolton; 14 *K. galas* Bolton; 15~16 *K. sparsipila* sp. n.; 17~18 *K. nyos* Bolton; 19~20 *K. fujianensis* Wang. 11, 15, 17, 19, Head in full face view; 12, 13, 14, 16, 18, 20, Body in profile view. ( 11~12 After Xu et al., 1995; 13, 14, 17~18 After Bolton, 1991; 19~20 After Wang, 1993 )

Fujian of China. And Xu et al. (1995) described another new species, *K. ashima*, from Yunnan of China. During the course studying biodiversity of ants of Xishuangbanna Nature Reserve, a new species, *K. sparsipila* sp. n., is also discovered. Bolton (1996, personal communication) suspected *K. ashima* was a synonym of *K. fujianensis*. In this study compared the original descriptions and illustrations of the two species, the shapes of propodeum in profile and body sculpture of the two species are different. So they are two independent species.

Up to date, 6 species of *Kartidris* are known in the world: 4 from China, 1 from India, and 1 from Thailand. It seems Southern Asia is the origin and distribution center of the genus, and Southern China is rich in species.

According to Bolton (1991) and Xu et al. (1995), the *Kartidris* species are terrestrial and live in mountainous areas.

#### Key to species of *Kartidris* of the world based on worker caste

1. In profile view, posterodorsal corner of propodeum close to a right angle. Vertex of head depressed in center, depression of head indistinct in profile view. Head and gaster brown, alitrunk yellowish brown (China: Yunnan) (Figs. 2, 11—12) ..... *K. ashima* Xu et Zheng
- In profile view, posterodorsal corner of propodeum forming a obtuse angle or bluntly rounded. Vertex of head distinctly depressed in profile view ..... 2
2. In profile view, posterodorsal corner of propodeum bluntly rounded ..... 3
- In profile view, posterodorsal corner of propodeum forming a obtuse angle ..... 4
3. In profile view, outline of propodeum raised to a distinct peak immediately behind metanotal groove. Dorsal alitrunk sparsely hairy, gaster with depressed pubescences. Colour light yellowish brown (Thailand, Nong Hoi) (Fig. 2, 13) ..... *K. matertera* Bolton
- In profile view, outline of propodeum not raised to a distinct peak. Dorsal alitrunk abundantly hairy, gaster without depressed pubescences. Colour uniform dark brown (China, Hainan) (Fig. 2, 14) ...  
..... *K. galos* Bolton
4. Dorsal alitrunk very sparsely hairy, dorsum of propodeum without hair. Head and gaster dark brown, alitrunk reddish brown (China: Yunnan) (Figs. 2, 15—16) ..... *K. sparsipila* sp. n.
- Dorsal alitrunk abundantly hairy, dorsum of propodeum with hairs. Colour uniform, light yellowish brown or reddish brown ..... 5
5. Entire cephalic dorsum with only vestigial sculpture, a very feeble superficial reticulation. Dorsal alitrunk virtually smooth except for the propodeum, which shows weak reticulation. Colour light yellowish brown (India: Meghalaya) (Figs. 2, 17—18) ..... *K. nyos* Bolton
- Cephalic dorsum with distinct sculpture, a dense reticulation. Pronotum and mesonotum with superficial but visible reticulation, propodeum densely granulated. Colour reddish brown (China, Fujian) (Figs. 2, 19—20) ..... *K. fujianensis* Wang

#### *KARTIDRIS SPARSIPILA* SP. N. (Figs. 2, 15—16)

Holotype worker, TL 4.1, HL 0.88, HW 0.78, CI 89, SL 0.85, SI 110, PW 0.55, AL 1.18, ED 0.23. Head nearly rectangular, longer than broad. Occipital margin and lateral sides feebly convex, occipital corners rounded. Mandibles with 5 teeth. Clypeus convex in center, anterior margin complete, roundly convex. Antennal scapes surpassing occipital corners by about 1/4 of its length, the apical 3 segments

forming the antennal club. Eyes situated behind midline of head. Vertex of head distinctly depressed in profile view. Pronotum high and roundly convex. Mesonotum lowering down as a slope. Promesonotal suture only visible on lateral sides, metanotal groove deeply depressed. Dorsum of propodeum straight in profile view, lowering down posteriorly, posterodorsal corner forming a distinct obtuse angle. Metapleural lobes small, rounded apically. In profile view, anterodorsal angle of petiolar node higher than posterodorsal one, subpetiolar process low. Postpetiolar node inclined posteriorly. Mandibles and clypeus finely longitudinally striate. Cephalic dorsum, pronotum, mesonotum, petiole, and lateral sides of postpetiole, with weak fine reticulation; distinct fine reticulation visible on propodeum and between eyes and frontal carinae; lateral sides of mesothorax with rough reticulation; petiolar node, postpetiolar node, and gaster with very weak superficial reticulation, shining. Head and body with sparse erect or suberect hairs and abundant decumbent pubescences, hairs on alitrunk very sparse, propodeum and petiolar node without erect hairs. Antennal scapes and tibiae with dense decumbent pubescences, but without erect hairs. Eyes without distinct projecting short hairs. Head and gaster dark brown; antennae, alitrunk, legs, petiole, and postpetiole reddish brown.

Paratype workers: TL 3.6—4.1, HL 0.80—0.91, HW 0.73—0.80, CI 88—91, SL 0.78—0.90, SI 103—113, PW 0.50—0.63, AL 1.08—1.25, ED 0.20—0.24 ( $n=6$ ). As holotype, but in some individuals petiolar node with a pair of erect hairs or postpetiolar node without erect hairs.

Holotype: worker, Sanchahe, 980m, Mengyang Town, Jinghong County, Yunnan Province, 1997-III-1, No. A97-90 (Lai Yuchu). Paratypes: 1 worker, with same data as holotype; 1 worker, with same data as holotype but No. A97-83 (Xu Zhenghui); 3 workers, with same data as holotype but Nos. A97-84, 92 (Dai Seping); 1 worker, Longlin Village, 1170m, Mengla County, Yunnan Province, 1997-III-4, No. A97-151 (Xu Zhenghui); 7 workers, Menglun Town, 690m, Mengla County, Yunnan Province, 1997-III-7, Nos. A97-195, 198, 206 (Dai Seping); 1 worker, Mengla, Mengla County, 1020m, Yunnan Province, 1996-III-12, No. A96-427 (Xu Zhenghui).

This new species is close to *K. nyos* Bolton (Figs. 2, 17—18), but erect hairs on dorsal alitrunk very sparse, gaster with decumbent pubescences; dorsum of propodeum more steep; anterodorsal corner of petiolar node higher than posterodorsal corner; body bicolour, head and gaster dark brown, alitrunk reddish brown.

Biological notes: Four colonies nesting in soil were revealed, numbers of individuals in each colony were respectively 16, 25, 48, and 52. Other individuals foraging on the ground were also collected.

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## 中国盲切叶蚁属、棒角蚁属和 无刺蚁属的分类研究 (膜翅目: 蚁科: 切叶蚁亚科)

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### 摘 要

中国现记载盲切叶蚁属 *Carebara* Westwood 1 新记录种——木盲切叶蚁 *C. lignata* Westwood, 并提供了测量数据和插图。棒角蚁属 *Rhopalomastix* Forel 为中国新记录属, 其中 1 新种——暗首棒角蚁 *R. umbracapita* sp. n. 被描述, 编制了该属全世界已知 4 种 2 亚种检索表。另发现无刺蚁属 *Kartidris* Bolton 1 新种——疏毛无刺蚁 *K. sparsipila* sp. n., 编制了该属全世界已知 6 种的检索表并附插图。对木盲切叶蚁、暗首棒角蚁和疏毛无刺蚁的主要生物学作了注释。这 3 种蚂蚁均采自西双版纳自然保护区的热带雨林。

关键词: 蚁科; 盲切叶蚁属; 棒角蚁属; 无刺蚁属; 系统分类